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INFORMATION REPORT INFORMATION REPORT

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CENTRAL INTELLIGENCE AGENCY

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COUNTRY East Germany

REPORT 50X1-HUM

SUBJECT Schwarze Pumpe Gasification Plant [- description, processing, labor force, new expansion capacity, gas pipeline construction, state planning for Schwarze Pumpe]

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1. At Schwarze Pumpe, the East German authorities planned to bring the first stage into production on 1 July 1962 with a capacity of 140,000 cub. meters (N.T.P.) of gas. This date has now been changed to 1964. The second stage was to go into action on 1 July 1963 and the third on 1 July 1964. These dates also connot be kept and the second stage has now been retarded to 1965, whilst no new date has been set for the third stage.

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2. Gas purification equipment for the second stage will be ordered originally the East German authorities expected to place the order in 1962 for delivery in 1963. Up to the present time, however, the contract has not been placed nor its technical details and the capacity of the equipment discussed

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Attachment: the translated text of an instruction paper recently issued to the staff engaged in the Schwarze Pumpe project in East Germany. (10 pages in English) 50X1-HUM

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INFORMATION REPORT INFORMATION REPORT

"SCHWARZE PUMPE"

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1. In the Soviet Union the many advantages of gas supply have long been recognised and considerable quantities of natural gas have been made available to the country's economy. As the D.D.R.'s resources in natural gas and anthracite deposits are small, an investigation has been made into the possibilities of remedying this deficiency.

2. In order to overcome the acute gas shortage, the Party and the Government have decided to incorporate a pressure gas works based on lignite into the third constructional stage of "SCHWARZE PUMPE". During 1962 a basis must be created at this Combine to permit the following production step-up in the interests of national economy: -

1964 150 million cub.metres of gas at N.T.P.

1965 700 " " " " " .

Considerable quantities of by-products will be gained, such as tar, middle distillation fractions, light oils and crude phenol, all valuable raw materials for our chemical industry.

3. As already stated, these tremendous quantities of gas will be produced by pressure gas works. Municipal gas was formerly only produced in coking plants and gas works by way of extraction from anthracite, but during the 'thirties a gasification process was evolved on the basis of theoretical calculations which permitted the use of lignite for municipal gas production. In order to meet the high demands for municipal and long distance gas supply, gasification must be effected under pressure in the presence of oxygen and steam.

4. A pressure of approximately 20 kp/cm^2 (sic) gives high yield of highly calorific methane and a reduction in the consumption of oxygen, as methane formation is exothermic. The introduction of oxygen is necessary to avoid undesirable nitrogen content in the gas.

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5. Apart from the small pressure gasification plant at HIRSCHFELDE near ZITTAU, this process was introduced at BÖHLEN on a large scale shortly before the 2nd World War. The pressure works at BÖHLEN is today one of the most important producers of gas in our Republic. As a result of experiences at BÖHLEN and in the pressure gas works at UZIN (Czechoslovakia) and at SHCHOKINO (USSR), the "SCHWARZE PUMPE" Combine pressure gas works was planned and its construction put in hand. The ready availability of raw materials, also the possibility of processing the by-products, necessitated the installation of a 3.6 m test generator at BÖHLEN of a type similar to,yet not so far developed as the one operating at "SCHWARZE PUMPE". Experiences at BÖHLEN enable difficulties hitherto encountered at "SCHWARZE PUMPE" to be forestalled. The new type generator was designed specially for this works and is reported to have a much greater capacity than the old BÖHLEN generators. Our task is to achieve without delay the projected generator capacities of 18 000 cub.metres (N.T.P.) of crude gas per hour with the use of dry screened lignite and 25 000 cub.metres (N.T.P.) of crude gas per hour with the use of briquettes. The capacity of a pressure gas generator is therefore many times that of the coal gas works of a small or medium sized town. Apart from this generator, a large number of newly developed plants are being installed at "SCHWARZE PUMPE", particularly in the sphere of engineering. The technological innovations adopted for the pressure gas works (e.g. the gas cleaning process which follows the "rectisol" process, cutting out at least four works departments of the old type pressure gas works) take into account all aspects of measuring, control and regulating technology. The complicated physico-chemical processes necessarily demand well-trained specialist personnel. The effects of high or low temperatures, high pressure or highly corrosive media present formidable problems for repair technology, such as they are otherwise known only to chemical works.

6. In contrast to the classical gas production process, the following are characteristics of the pressure gas process:

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i) The use of lignite permits the production of full standard municipal or trunk supply.

ii) Gas is produced for its own sake. No special consideration need be given to good coke yield, as the coal is gasified completely and maximum gas yield is the main purpose of the process.

iii) Cheap fuels with high ash content can be gasified.

iv) The thermal efficiency is high. All by-products are obtained in the form of gas, tar, oil, phenol and sulphur.

v) For the pressure process, small volumes only are sufficient for large output. This means a saving in space and installation costs.

vi) The gas, under a pressure of 20 kp/cm^2(sic), can be fed into the trunk mains avoiding the additional high costs of compression.

vii) The plant is exceedinglyadaptable. Conversion from "full load" to "no load" - and vice versa - can be effected within a few minutes. Generators can be held in reserve at red heat for weeks on end.

7. For the purpose of scientific and technical progress, coal refining has a very important role in the framework of overall power supply. By introducing the pressure gasification process, the "SCHWARZE PUMPE" Combine is more and more living up to its importance as a coal refining combine. Gasification under pressure can at present be described as the highest degree of coal refining. In comparing the great convenience in gas production, trunk distribution and for consumers, the following advantages emerge which no other refining process can offer : -

i) Bearing in mind the heat losses incurred in briquette works and power stations, it is shown that 57.7% of the thermal energy gained from open-cast mining is still gained in the form of gas, tar and light fractions.

ii) If one bases an example on the quantity of briquettes produced in the D.D.R. in 1960, i.e. 50 million tons, one will require 50 000 goods trains (1000 tons per train) to transport this quantity of fuel to the

/ consumers....

ii) contd.

consumers. Although large quantities of briquettes are processed locally, the large number of goods trains shows how cumbersome and uneconomic rail transport can be, prone as it is to bottlenecks. One must also remember that the conveyance of considerable quantities of ash and water means unproductive transport.

The development of the trunk gas system in the D.D.R. reaching from STRALSUND to the Thüringen Forest and from MÜLHAUSEN/Thür. to GÖRLITZ, supplies all parts of the Republic through pressure mains at 20 and 50 atmospheres, involving a minimum of transport costs and achieving a high level of work productivity. The gas is completely ash-free and practically water- and sulphur-free. From the "SCHWARZE PUMPE" Combine, three main trunk gas lines are being laid to LAUCHHAMMER for subsequent compression and further distribution, as well as a trunk gas supply line to GÖRLITZ and one to FRANKFURT/Oder. Underground containers are planned to store excess gas during the summer months, to be available for peak load periods during the winter.

iii) Gas firing in industry, trade and in the home not only means a minimum of work but, in contrast to coal firing, offers the possibility of complete automation, economical regulation and a very high degree of efficiency.

8. The supply of gas to our economy ensures the best exploitation of this valuable raw material - coal. The tendency no longer to regard coal as fuel, but as a chemical raw material, increases the life-span of our limited coal reserves. For this reason alone, there is a pressing need to give technological progress a chance to forge ahead with the modern pressure gas process, increasing the degree of efficiency from producer to consumer. A study of the present gas situation in the D.D.R. shows that great emphasis must be given to these conclusions, the development of pressure gasification being a matter of life and death for our Republic. The following points are matters of

/ serious ....

serious consequence for present gas supply: -

i) The gasworks in our Republic number some 200, the majority of which are small. They are operated to full capacity in order, to some extent, to meet the demands. Their age precludes any further increase in capacity or any reconstruction. 50X1-HUM

ii) During the winter months large quantities of gas must be imported [redacted] involving considerable expenditure [redacted]

iii) As trunk gas supplies are inadequate, several works have had to build additional low pressure gas generators which has meant tying up valuable investment capital. (The low pressure gas, considered in the light of economy on the national level, comes more expensive than trunk gas mixed with low pressure gas.) Works thus affected were, for example, the Plate Glass works at TORGAU and the Television Tube Works at FRIEDRICHSHAIN.

iv) Large quantities of gas are used in smelting. For instance, when the Nickel Works of SANKT EGIDIEN was taken into operation, the provision of additional quantities of trunk gas presented the greatest difficulties so far encountered in gas supply.

v) Gas supply to the population must be guaranteed at all times. Every cold spell places the utmost strain on the gasworks and coking plants in a fight for every cubic metre of precious municipal gas. For many years now repairs are mainly carried out on Sundays and holidays, and general overhauls are confined to the summer months.

9. This adverse state of affairs can be finally eliminated as soon as our plant at "SCHWARZE PUMPE" goes into action. The quantities of gas to be produced in 1964 and 1965 with 12 generators are only the beginning of the first production stage. With 40 projected generators in the SENFTENBERG lignite area, we will be installing the largest pressure gas works on a world scale.

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10. Today we appeal to every worker employed on the greatest pressure gas works in the world to do his utmost to ensure fulfilment of the target date: 15th April 1964, scheduled for taking the works into operation. We ask this of you as achievement of this is of decisive importance to our whole Republic - and even to the whole Socialist camp.

11. The pressure gas works consists of three large sections: the oxygen plant, the gas production plant and the installations for gas purification, includirg tank storage and phenol extraction plant. The progress of building operations is approximately the same for all plant, even if certain sections present great difficulties that have to be overcome. Firstly, a few special features must be described:- The pressure gasification plant presents an interesting cross-section through all spheres of industrial and steel construction. In the Pressure Gasification unit there are hydraulic, also stressed concrete installations as well as huge halls constructed of prefabricated ferro-concrete parts, and there is the imposing generator house which has a steel skeleton construction.

12. During planning, a guiding principle was intelligent use of pre-fabricated parts. This principle has prevailed throughout cooperation between the builders and the planning staff, and is reflected in the projects themselves. This cannot however disguise the fact that greater quantities of standardised pre-fabricated parts should be used in many cases. Where technology permits, construction should go over on a large scale to the open building method (Freiluftbau). The first steps in this direction can be seen in the tar extraction and middle-fraction plants, as well as in the two cooling water circuits.

13. A few figures may illustrate the vastness of the task to be completed before the first gas leaves our works in 1964 : The volume of investments necessary for the first stage of production amounts to approximately 194 million DMs. The proportion set aside for building comes to about 40 million DMs. For the sake of comparison, these 40 million DMs would build two thousand 2½-room flats. The proportion envisaged for steel constructions

amounts to approximately 16 million DMs, or 9000 tons of steel construction. The figures mentioned do not however include the contributions to be made by other main units such as the Power Station, Briquette Works, Hydraulic Works, the cultural welfare buildings, the transport installations, etc., before the works are taken into operation.

14. Another special feature is the Control Centre (Messwarte). Setting a precedent for other pre-fabricated buildings, a break was made with traditions of concrete and steel standards (concrete 225, steel I), the finished parts being made of concrete 450 and steel IIIa. These concrete and steel standards have not been applied to any other items in the Combine. In this particular case, the use of such high quality building materials was the only economic solution.

15. Other special features worth mentioning are the gas vessels which for the first time in the D.D.R. have been made of stressed concrete.

16. For assembly of the pre-fabricated parts, there was a lack of suitable lifting tackle as employed for the power station and the briquette works. Derricks had to be used for the heavy pre-fabricated parts, for construction of the large hall of the air separation plant as also for the "rectisol" plant. This method of assembly wastes much time and does not in any way contribute to work productivity.

17. One may ask what lessons have so far been learnt in the construction of the pressure gas works. A serious handicap in preparing the sequence of building operations was the long time required for planning certain part-objectives, which meant that different targets had to be fixed for the issue of building data. A negative affect on the course of building operations was to some extent only avoided by the concerted efforts of the planning staff, the builders and the Management of Building Investment.

18. In 1960, the building tasks planned for that year were not completed, as in spite of firm contracts the building industry was not in a position - owing to lack of capacity - to realise the total envisaged. By early 1961,

work on many objectives in the gas purification section, for instance, was not even begun. However, the year 1961 developed more favourably and showed satisfactory progress in the individual achievements of the BMK, with exception of the cooling water circuit in the northern area of the gas works. Much concern is caused by the BMK's inadequate capacity for development with the consequent failure of its sub-sontractors. It must nevertheless be noted that, on the whole, targets were fulfilled due to the individual achievements of the BMK, yet free targets applying to subsidiary operations were barely fulfilled. These circumstances mainly hampered supply works at the beginning of assembly. The present contracts with the supply works are so tight as regards assembly time that the BMK has to insist on absolute adherence to targets. All colleagues of BMK must keep a strict watch over the fulfilment of definite time limits (Ecktermine) by the individual building managements, or rather see that they are fulfilled ahead of time.

19. Deep concern is also felt for the steel construction assembly for the generator house. Whereas the VEB-DIMITROFF works at MAGDEBURG are meeting their commitments in manufacturing the generators, the VEB-STAHLBAU in MAGDEBURG is behind schedule with the steel assembly. After several postponements, the first pressure gas generator has at last been installed in the generator house. To overcome the difficulty Comrade LESINSKI, the Works Manager of "SCHWARZE PUMPE", made personal representations with the Works Directorate of VEB-STAHLBAU in MAGDEBURG demanding additional manpower to improve organisation on the building site.

20. The most important task confronting VEB-STAHLBAU is to fulfil the State Plan target of 14th July 1962 for completion of the central section of the generator house. This means that the organisation of work must be improved considerably and that colleagues must cooperate more in setting up assembly schedules.

21. Another special feature of the pressure gas works is the fact that large installations are operated from a central control panel (Messwarte)

and that requirements in personnel are small as compared to other works. At BÖHLEN, 100 employees are required for the production of 100 million cubic metres (N.T.P.) of gas per annum, whereas only 26 employees are foreseen for the same quantity of gas at our pressure works. High standards of functional efficiency must be demanded of the installations, as well as high qualifications of the operating personnel. The question of functional efficiency has received special attention for a long time. Representatives from our works have played a decisive part in the development and execution of trials on the pressure test generator at BÖHLEN. Although results are not yet fully satisfactory, much experience has been gained in the last year on this new super large-scale enterprise. By the end of 1962 we expect tests to have been completed and the generators to be ready for operation.

22. One great problem for the pressure gas works is the huge requirement for tubes and measuring, control and regulating equipment. It is up to VVB EKM and VVB REGLUNGSTECHNIK to provide the necessary manufacturing and assembly personnel. The constant changes effected by the latter VVB should cease forthwith. It must not happen again that when the all-clear is given for the assembly of tubes (e.g. as from 1st May) this opportunity is not taken up.

23. By the end of 1962, large parts of the equipment, including tubes, must be installed so that the next works on the list, e.g. TELTOW, RFT-COTTBUS, VEM-COTTBUS, etc., can go ahead with the electrical installations.

24. The "rectisol" plant for gas purification was purchased [redacted] The Party and Government have always given great attention to such trade relations and hope to develop them further. All large items are already assembled, giving the Combine a new face which can be seen from afar. The [redacted] businessmen and engineers [redacted] are also interested in supplying further installations of this kind. However, [redacted] machinations [redacted] have led us to take suitable measures to protect also the pressure gas works for the "SCHWARZE

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PUMPE" Combine. Against [redacted] disruptive manoeuvres we set our Socialist communal efforts and the political clarity of all workers. They can no longer prevent our gas production. It will come whether they like it or not.

25. The Party and the Government ask us to complete the assembly for the first stage of production by 31st March 1964 and start the trial run from 15th April 1964, thereby supplying the first gas to the D.D.R. grid. Every day of delay means a loss to the works of 2 million cubic metres of crude gas in 1965. At a cost of 10 Dpf per cubic metre, this represents a loss of DM 200 000 per day. It is also estimated that 1 cubic metre of gas produces a glass processing equivalent to the value of 1 DM. for optical apparatus, thermometers and other scientific equipment. It is essential, therefore, to exploit every possibility of furthering the production drive: -

work a 6-week day

exploit best working times

use the most modern assembly techniques

ensure maximum exploitation of working time.
